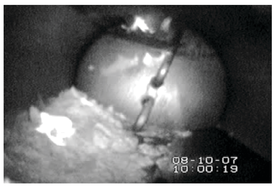
TOCDF Mustard Agent Campaign

The Tooele Chemical Agent Disposal Facility (TOCDF) faced several challenges during its mustard agent campaign — each was met with an innovative solution.

A TOCDF worker reaches inside a glove box to draw a sample of mustard agent from a ton container.

A sample vial containing less than 1 milliliter of mustard agent is prepared for analysis.



The interior of a mustard agent-filled ton container with semi-solid material, known as heel.

The interior of a ton container after the HTS is used to break down and remove a portion of the heel.

Workers install three massive sulfur-impregnated carbon filter units.

The interior of the TOCDF Pollution Abatement System Filtration System.

A specially designed cutter machine makes a single cut around the top of a mustard agent-filled 4.2-inch mortar.

TOCDF workers safely remove the burster from a 4.2-inch mortar.

MUSTARD CHARACTERIZATION

Deseret Chemical Depot's (DCD) entire stockpile of mustard agent-filled ton containers (TCs) — 6,399 total — were sampled and segregated based on mercury content and/or heel (semi-solid material) weight. Inside DCD's storage area, two igloos were equipped with three identical glove boxes where samples of the mustard agent were collected and heel depths were measured. The comprehensive sampling project confirmed that approximately 15 percent of the TCs were contaminated with elevated levels of mercury and more than 50 percent had heavy heels.

HEEL TRANSFER SYSTEM

TOCDF designed and installed the Heel Transfer System (HTS) to effectively deal with mustard TCs that contained heavy heels. The HTS used a high-pressure, warm-water spray to reduce the amount of heel inside some of the TCs. The system liquefied the heel so that it could be transferred from the original TC to an empty TC. Once the transfer was complete and both TC heel weights were less than 630 pounds (the maximum weight allowed by TOCDF's operating permit), both TCs were processed through the facility's Metal Parts Furnace.

POLLUTION ABATEMENT SYSTEM (PAS) FILTRATION SYSTEM (PFS)

Due to the mercury content found in some of the TCs and 4.2-inch mortars, the existing TOCDF pollution abatement system was modified with an additional filtration system utilizing sulfur-impregnated carbon to effectively capture and remove mercury from exhaust gases.

CUTTER OPERATIONS

The last mustard campaign at TOCDF — destruction of 333 overpacked 4.2-inch mortars and 155mm projectiles — proved to be the most challenging. The facility's Explosive Containment Rooms were equipped with remote-controlled cutting equipment to assist with the removal of explosive components. Because the mustard fill inside some of the projectiles had become so hardened, the burster and burster well were stuck in place. In this case, a new torque adapter tool was used to help loosen the burster well and if necessary, a washout system was used to soften the agent so that the burster and burster well could both be safely removed.